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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/784,436	02/23/2004	William M. Hiatt	2269-5868US (01-0764.00/U)	2546
24247	7590	09/26/2007	EXAMINER	
TRASK BRITT P.O. BOX 2550 SALT LAKE CITY, UT 84110			SCHILLINGER, LAURA M	
			ART UNIT	PAPER NUMBER
			2813	
			NOTIFICATION DATE	DELIVERY MODE
			09/26/2007	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

USPTOMail@traskbritt.com

## Office Action Summary

Application No.

10/784,436

Applicant(s)

HIATT, WILLIAM M.

Examiner

Laura M. Schillinger

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 29 May 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anthony ('836), and further in view of Narahara et al ('834).

Anthony teaches the following claimed limitations as cited below:

1. (Original) A method for electrically coupling a first side of a semiconductor substrate to a second side of said semiconductor substrate, comprising:  
forming a hole having an inner surface from a first side of a semiconductor substrate to a second side of said semiconductor substrate (Fig.1 (12)) and  
plating said inner surface of said semiconductor substrate to form a plated conductive element by forcing a plating solution from said first side of said semiconductor substrate and exiting the plating solution to said second side of said semiconductor substrate through said hole (Fig.3 (18) and Col.5, lines: 45-50- teaching to cause the plating solution to flow through the holes).

Anthony teaches boring a hole through an electrically insulating glass substrate for semiconductor applications. This effectively creates a substrate with an inner insulating surface

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and therefore Anthony fails to teach Applicant's amended claim limitation requiring the additional step of forming an insulating layer on the inner surface of the hole and then plating over the insulating layer.

However, Narahara teaches oxidizing the inner surface of a hole to improve adhesion to a subsequently plated metal layer (Col.1, lines: 45-65).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Anthony to include forming an insulating layer inside the hole in order to improve adhesion to the subsequently plated metal layer as taught by Narahara. Moreover, such a film forming step would produce predictable results since the glass substrate is insulative and therefore the hole formed would have an insulating surface and further forming a insulating film in a through hole would also create a hole having an insulting inner surface.

2. (Original) The method of claim 1, wherein forming said hole comprises at least one of ablating, mechanically drilling and chemically etching a portion of said semiconductor substrate from said first side to said second side (Col.2, lines: 45-55).

3. (Original) The method of claim 1, further comprising loading said semiconductor substrate into a plating fixture, said semiconductor substrate and said plating fixture cooperatively directing flow of a plating material through said hole of said semiconductor substrate (Col.5, lines: 45-55).

4. (Original) The method of claim 1, wherein said plating comprises electroplating said inner surface of said semiconductor substrate defined by said hole (Fig.3 (18)).
5. (Original) The method of claim 1, wherein said plating process comprises electroless plating said inner surface of said semiconductor substrate defined by said hole (Col.1, lines: 55-62).
7. (Original) The method of claim 1, further comprising etching one of said first and second sides of said substrate to expose at least one end portion of said plated conductive element (inherent- laser drilling is an etching which ultimately exposes the end portion of the plated conductive element hole).
9. The method of claim 1, wherein said hole is between approximately 50 microns and 700 microns in diameter (Col. 2, lines: 1-5- 1mil =25.4 um).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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Claims 6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anthony ('836) and Narahara et al ('834) as applied to the claims above, and further in view of Bhatt et al ('218).

Anthony teaches the conventional method of plating a through hole. However fails to explicitly teach that the technique of plating a filled through hole.

Bhatt et al teaches that both holes to be filled and unfilled need electroplating and further teaches to utilize capping layers:

6. The method of claim 1, further comprising forming a conductive cap on at least one end of said plated conductive element (Col.3, lines: 20-25)).

8. (Original) The method of claim 7, further comprising forming a conductive cap over said at least one end portion of said plated conductive element (Fig.1 (13)) .

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize a conductive cap as taught by Bhatt in order to facilitate a connection with a filled hole as taught by Bhatt (Col.3, lines: 15-25)

### ***Response to Arguments***

Applicant's arguments with respect to the above claims have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura M. Schillinger whose telephone number is (571) 272-1697. The examiner can normally be reached on M-T, R-F 7:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl W. Whitehead, Jr. can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Laura M Schillinger', with a large, stylized flourish at the end.

Laura M Schillinger  
Primary Examiner  
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09/12/07